

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim Listing

1. (Currently Amended) A method for reducing the extent of protease degradation of a protein applied to or produced by a plant comprising administering to the plant or a part thereof a peptide comprising indolicidin, Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile (SEQ ID NO:4) (Rev4), or a functional equivalent of indolicidin or Rev4, wherein said functional equivalent possesses protease inhibitory activity comprising ability to increase resistance of the protein to degradation or inactivation by proteases,

wherein:

a) when the peptide with protease inhibitory activity is applied to a plant, the protection is provided against proteases external to the plant,

b) when the peptide with protease inhibitory activity is produced by a plant, the protection against proteases is intracellular to the plant unless accompanied by a secretion signal peptide, and

c) when the peptide with protease inhibitory activity and the protein to be protected from protease degradation and/or inactivation are expressed in the same intracellular space, the protection against proteases is provided in the intracellular space.

2. (Original) The method of claim 1 wherein said functional equivalent comprises the formula:

X-X-Y-Y-Y-Y-Y-X-Y-Y-Y; or

Y-Y-Y-Y-X-Y-Y-Y-Y-X-X

wherein each X is independently arginine, lysine or histidine; and

wherein each Y is independently tryptophan, glycine, alanine, valine, leucine, isoleucine, proline, phenylalanine, methionine, or lysine.

3. (Previously Presented) The method of claim 1 wherein said peptide comprises a functional equivalent of Rev4 which is Ser-Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile (Ser-Rev4-OH) (SEQ ID NO:5).

4. (Previously Presented) The method of claim 1 wherein said peptide comprises a functional equivalent of Rev4 which is Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile-Gly-Gly-Gly-Tyr-Asp-Pro-Ala-Pro-Pro-Pro-Pro-Pro (SEQ ID NO:6) (Rev4-C-Fusion).

5. (Original) The method of claim 1 wherein said protein is an antipathogenic agent.

6. (Original) The method of claim 5 wherein said protein is an antibacterial agent.

7. (Original) The method of claim 5 wherein said protein is an antifungal agent.

8. (Original) The method of claim 5 wherein said protein is an antiviral agent.

9. (Original) The method of claim 5 wherein said protein is an insecticidal agent.

10. (Original) The method of claim 1 wherein said protein is selected from the group consisting of Magainins, reverse Magainins, PGLc, reverse PGLc, PI's, reverse PI's, Cecropins, reverse Cecropins, Sarcotoxins, reverse Sarcotoxins, Bombinins, reverse Bombinins, XPFs, reverse XPF's, Thionins, reverse Thionins, Defensins, reverse Defensins, Melittins, reverse Melittins, PGL *a*, and reverse PGL*a*, Dermaseptins, reverse Dermaseptins, Histatins, reverse Histatins, peptides derived from pig myeloid cells, peptides derived from human neutrophil cathepsin G, antimicrobial peptides from bovine neutrophils, Seminalplasmin, antimicrobial derived from Lactoferrin, Drosocin, Tachyplesins, reverse Tachyplesins, Maize Basic Peptide I, Tracheal antimicrobial peptides, Antimicrobial peptides from seeds of amaranth, antimicrobial peptides from seeds of *Mirabilis jalapa*, Ranalexin, Brevenin, Subtilin, Nisin, Epidermin, Lactacin 481, and basic amphipathic peptides.

11. (Currently Amended) The method of claim 1 wherein said protein is selected from the group consisting of enzymes, pharmaceuticals, agricultural products, feed additives or and food additives.

12. (Original) The method of claim 1 wherein said peptide is Rev4 and said protein is selected from the group consisting of Magainins and reverse Magainins.

13. (Original) The method of claim 1 wherein said administering comprises transforming said plant or part thereof with an non-native DNA comprising a sequence encoding said peptide.

14. (Original) The method of claim 1 wherein said administering comprises spraying said plant or part thereof with a composition comprising said peptide functional equivalent.

15. (Original) The method of claim 14 wherein said composition further comprises said protein.

16. (Original) The method of claim 14 wherein said spraying said plants or parts thereof is conducted after said plant or part thereof is harvested.

17. (Original) The method of claim 14 wherein said spraying said plants or parts thereof is conducted during processing or formulation of said plant or part thereof.

18. (Original) The method of claim 1 wherein said protease is a plant protease.

19. (Original) The method of claim 1 wherein said protease is a bacterial protease.

20. (Original) The method of claim 1 wherein said protease is a viral protease.

21. (Original) The method of claim 1 wherein said protease is a fungal protease.

22. (Original) The method of claim 1 wherein said protease is an insect protease.

23. (Original) The method of claim 1 wherein said plant or part thereof is selected

from the group consisting of maize, tomato, turfgrass, asparagus, papaya, sunflower, rye, beans, ginger, lotus, bamboo, potato, rice, peanut, barley, malt, wheat, alfalfa, soybean, oat, eggplant, squash, onion, broccoli, sugarcane, sugar beet, beets, apples, oranges, grapefruit, pear, plum, peach, pineapple, grape, rose, carnation, daisy, tulip, Douglas fir, cedar, pine, spruce, peas, cotton, flax, coffee and tobacco.

24. (Original) The method of claim 1 wherein said peptide is fused with at least one other peptide.

25. (Original) The method of claim 1 wherein said peptide is conjugated with at least one other peptide.

26. (Original) The method of claim 1 wherein said peptide is administered by applying said peptide to said plant or part thereof and said peptide is crosslinked with at least one other peptide.

27. (Original) A method of inhibiting the growth of a plant pathogen comprising administering to a plant or part thereof Rev4 or a functional equivalent thereof.

28. (Original) A peptide comprising Rev4 (Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile) or a functional equivalent thereof.

29. (Original) A nucleic acid molecule comprising a sequence encoding Rev4 (Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile) or a functional equivalent thereof.

30. (Original) The nucleic acid molecule of claim 29 comprising AGGAGATGGCCTTGGTGGCCTTGGAAATGGCCTCTTATT or a complement thereof.

31. (Original) The nucleic acid molecule of claim 29 which is DNA.

32. (Currently Amended) The nucleic acid segment molecule of claim 29 which is RNA.

33. (Original) A nucleic acid construct, comprising from 5' to 3', a transcriptional

initiation region functional in plants, a nucleic acid sequence encoding Rev4 or a functional equivalent thereof, and a transcriptional termination sequence.

34. (Original) The nucleic acid construct of claim 33 further comprising a regulatory nucleic acid sequence.

35. (Original) The nucleic acid construct of claim 33 further comprising a reporter gene.

36. (Currently Amended) A transgenic plant comprising a nucleic acid including a sequence encoding Rev4 ~~or~~ or a functional equivalent thereof.

37. (Currently Amended) The transgenic plant of claim 36 wherein said sequence encodes a functional equivalent ~~or~~ of Rev4 comprising the formula:

X-X-Y-Y-Y-Y-Y-X-Y-Y-Y-Y

wherein each X is independently arginine, lysine or histidine; and

wherein each Y is independently tryptophan, glycine, alanine, valine, leucine, isoleucine, proline, phenylalanine, methionine, or lysine.

38. (Original) The transgenic plant of claim 36 further comprising at least one nucleic acid sequence encoding a protein of agronomic interest.

39. (Original) A method of making a plant, comprising preparing a plant having a genome that contains a DNA sequence encoding Rev4 or a functional equivalent thereof wherein said sequence is expressed.

40. (Original) The method of claim 39 comprising stably transforming a protoplast with said DNA molecule, and generating the plant from the transformed protoplast.

41. (Original) The method of claim 39 comprising introducing the DNA molecule into plant tissue, and regenerating the plant tissue containing the DNA molecules.

42. (Original) The method of claim 39 wherein said plant further contains a DNA sequence encoding a protein of agronomic interest.

43. (Original) A seed derived from the plant of claim 36.

44. (Original) A plant cell comprising a nucleic acid sequence encoding Arg-Arg-Trp-Pro-Trp-Trp-Pro-Trp-Lys-Trp-Pro-Leu-Ile (Rev4) or a functional equivalent thereof.

45. (Original) The plant cell according to claim 44 further comprising a nucleic acid sequence encoding an agronomic protein of interest.

46. (Original) A composition for use in protecting a peptide, polypeptide or protein from protease degradation, comprising Rev4 or a functional equivalent thereof and a carrier.

47. (Original) The composition of claim 46 wherein said functional equivalent comprises the formula:



wherein each X is independently arginine, lysine or histidine; and

wherein each Y is independently tryptophan, glycine, alanine, valine, leucine, isoleucine, proline, phenylalanine, methionine, or lysine.

48. (Original) The composition of claim 47 further comprising a protein of agronomic interest.